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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/705,351 | 11/03/2000 | Yuichi Ijiri | 4296-125 | 6855 |
| 7590 | 11/28/2006 | | EXAMINER | |
| Mathews Collins Shephaerd & Gould PA 100 Thanet Circle Suite 306 Princeton, NJ 08540 | | | FORD, JOHN K | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3744 | |

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/705,351 | IJIRI ET AL. | |
| | Examiner | Art Unit | |
| | John K. Ford | 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Sept 5, 2006 + June 13, 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 5, 18 and 25-29 is/are pending in the application.
- 4a) Of the above claim(s) 28+29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 18, 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Applicant's responses of June 13, 2006 and September 5, 2006 have been carefully considered. Applicant is reminded that the elected species remains that of Figure 10, with the sub-species of Figure 3 (not Figure 2 as stated by counsel in the September 5, 2006 response), elected by supplemental response received July 23, 2002. Applicant has identified claims 1, 5, 18 and 25-29 as readable on the elected species. The issues are addressed in the order applicant has presented them in the June 13, 2006 response.

Newly submitted claims 28 and 29 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 28 and 29 are apparently method of use claims with no method steps in them. That aside, since applicant has received an action on the merits (see office action dated January 9, 2006) for the apparatus elected on August 2, 2004 (with the method of using the heat exchanger to process certain claimed polymerizable substances being non-elected on that date) as the presented invention, this invention (i.e. the heat exchanger) has been constructively elected by the previous restriction requirement for prosecution on the merits. Accordingly, claims 28 and 29 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. The examiner informed applicant in the office action dated August 25, 2006, of his intent to hold these as withdrawn in the next office action. Given that applicant's September 5, 2006 response was silent on the matter, the examiner assumes that this matter is settled.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 5, 18 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 18 it states that the shell side port (by disclosure, port 1004 in Figure 10) and the drain pipe (by disclosure, port 1007 in Figure 10) are "immediately adjacent" one another. This appears to be entirely mis-descriptive as the two ports in question are on opposite sides of the heat exchanger in positions that are about as far apart as one can imagine.

As well, in claims 1 and 18, when it comes to claiming using words requiring assessment of a "degree" of closeness (i.e. "*immediately adjacent*") the specification must give the reader some yardstick by which to measure such a degree of closeness. It does not here. There is no guidance as to how to figure out whether or not something is "immediately adjacent". See Seattle Boxcar v. Industrial Crating, 221 USPQ 568, 573-574 (Fed. Cir. 1984), discussing an indefiniteness rejection. The Examiner believes that such a limitation is inherently ambiguous.

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Applicant's response has been to point out that such language may be descriptive of Figure 9, apparently or perhaps Figure 12. The term "immediately adjacent " is mis-descriptive of the drain arrangement in elected Figure 10. It is axiomatic that the claims designated to read on a particular species must be descriptive of it. The fact that the claim may be supported by some non-elected species is not a remedy to the problem. No consideration has been given by counsel to the holding of Seattle Boxcar. It is submitted that one cannot redefine a term in a manner repugnant to its conventional meaning in regard to page 7, line 31-page 8, line 4 of applicant's specification.

In claim 25, structure external to the heat exchanger is claimed, namely some sort of nozzle in piping external to the heat exchanger. Perhaps applicant should be claiming a heat exchange system rather than just a heat exchanger in claim 25. The elected species of Figure 10 doesn't have any disclosure of a "nozzle" that the examiner is aware of. Non-elected Figure 5B has some orifice plates 519 that are used to generate a back-pressure (see page 13, lines 11-21). Claim 25 appears to be mis-descriptive of Figure 10, the elected species.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Deuse (USP 4,236,576).

Note in Figure 1 that conduits 23 and 17 are deemed to be "immediately adjacent" to one another outside of the heat exchanger and are connected together so that they pass the same fluid. If not, to have made them so to save on piping would have been obvious to one of ordinary skill. Note in Figures 2 and 3 that vent pipe 23 is connected to the upper tube sheet (shown in cross-section in Figure 3), which is formed with conduits 22 and 21 internal to it (very similar to what applicant has disclosed in elected Figure 3). Regarding claim 5, Deuse is a tube and shell heat exchanger.

The fact that, in use, applicant's heat exchanger may vent a gas through the vent pipe is not relevant to the patentability of the claimed apparatus over Deuse. See MPEP 2114, incorporated here by reference. Applicant's apparatus claims must distinguish over the prior art based on some claimed structural difference. Specifying a gas as the preferred substance to vent does not make the apparatus undergo a metamorphosis into a new apparatus. Finally, Deuse discloses a "steam-water" mixture

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is passed into cooling channels 21 and ultimately discharged through conduits 23 and 18. Thus, notwithstanding anything stated above, vent pipe 23 of Deuse does, in fact, vent a gas (i.e. steam) as part of a steam-water mixture.

Claims 18 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Kieren (USP 808,385) and Deuse (USP 4,236,576).

In Kieren an inlet port for the tube-side fluid is shown at 15 and an outlet port for the same at 29. An inlet port for the shell-side fluid is shown at the juncture of pipe 30 and shell 5. An outlet for the shell-side fluid is shown at 31. A drain pipe 33 is formed as part of the lower tube sheet 19 and drains chamber 18. Drain pipe 33 has the same fluid passing through it as the outlet for the shell-side fluid is shown at 31. The aforementioned discussions of the meaning of "immediately adjacent" in the context of these claims are incorporated here by reference.

Deuse (USP 4,236,576) is discussed above and that explanation is incorporated here by reference.

To have provided the upper tube plate (11) of Kieren with a port (23 and associated passages 22 and 21 as taught by Deuse in Figure 3) would have been obvious to one of ordinary skill to improve the efficiency of the device by allowing more flow of the shell-side fluid over the outside of the tubes near the top of the device.

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Furthermore, to have connected that port (in the modified Kieren structure) to the outlet the port at the upper end of pipe 17 of Kieren or to the pipe existing to the left of the junction of pipes 31 and 33 in Kieren would have been obvious to one of ordinary skill in the art to permit the flow to be conveniently pumped away without the necessity of two pumps. This connection to the port in the modified Kieren structure is fairly taught by Deuse (where pipes 17 and 23 are shown to be connected to one another).

Regarding claims 26-27, the fact that, in use, applicant's heat exchanger may have certain substances passed through it is not relevant to the patentability of the claimed apparatus over the prior art. See MPEP 2114, incorporated here by reference. Applicant's apparatus claims must distinguish over the prior art based on some claimed structural difference. Specifying the preferred heat exchange substances to be passed through the heat exchanger does not make the apparatus undergo a metamorphosis into a new piece of apparatus.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Deuse (USP 4,236,576) and Brucher (USP 5,035,283).

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Deuse is explained above and that explanation is incorporated here by reference. Burcher in Figures 1 and 4 discloses a shell side inlet at the junction of pipe 23 and shell 2 (i.e. the downstream end of pipe 23) and a shell-side outlet 17. The tube-side inlet and outlet are substantially identical to what is shown in Deuse. A drain pipe is formed by pipe 23, channel(s) 10, channels 7, and connector(s) 11. The drain pipe reaches the interior of the shell through passageways 15 (best seen in Figure 4). The "other end" of the drain pipe is connected to the shell at the junction of pipe 23 and shell 2 (i.e. the downstream end of pipe 23) and passes the same fluid as the second fluid passing port. The term "drain pipe" in both this rejection and in applicant's disclosure is something of a misnomer given that 1007 in Figure 10 is another inlet to the shell.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the prior art rejections above as applied to claim 18 above, and further in view of McNeal (USP 2,181,704).

McNeal teaches a back-pressure valve at 61 that would have been obvious to have used in any of the prior art systems discussed above to advantageously increase the shell side pressure to improve heat transfer and prevent boiling.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

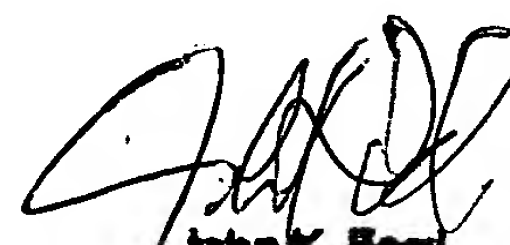
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John K. Ford whose telephone number is 571-272-4911. The examiner can normally be reached on Mon.-Fri. 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John K. Ford
Primary Examiner